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SECY-656

November 20, 1970



This document consists of 17 pag

Copy No. 18 of 36 Series A

INFORMATION MEETING ITEM

LASER CLASSIFICATION PANEL

Note by the Secretary

The General Manager has requested that the attached memorandum of November 19, 1970 from the Director of Classification, with enclosed draft letter of appointment, be circulated for consideration by the Commission at an early Information Meeting.

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW	
DATE: 8/10/2009	DETERMINATION (ICR NUMBER(S))
AUTHORITY: DDC	CLASSIFICATION RETAINED
NAME: G. Thompson	CLASSIFICATION CHANGED TO:
2ND REVIEW DATE: 11/2/70	1. CONTAINS UNCLASSIFIED INFO
PRIORITY: DC	2. COORDINATE WITH [ ]
NAME: G. Thompson	3. CLASSIFICATION CANCELED
	4. CLASSIFIED INFO BRACKETED
	5. OTHER (SPECIFY):

W. B. McCool

Secretary of the Commission

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UNITED STATES  
ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20545

NOV 19 1970

Chairman Seaborg  
Commissioner Ramey  
Commissioner Johnson  
Commissioner Thompson  
Commissioner Larson

NCL

THRU: <sup>for</sup> General Manager *Donald C. Kull*

LASER CLASSIFICATION PANEL

At the Information Meeting on November 13,\* the Commission reviewed SECY-625 "Guidance to Laser Classification Panel".

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*DOE  
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The Commission then requested that the proposed letter of appointment for the members of the Classification Panel be appropriately revised to reflect that decision and the Commission's desire to limit the scope of activity by specifically requesting that the Panel limit its discussion to the five questions that were outlined in SECY-625.

The enclosed proposed letter has been prepared for this purpose. Some of the five questions have been appropriately revised to take into account the new circumstances resulting from the Commission's decision to hold as classified the two items of information mentioned above.

*C. L. Marshall*  
C. L. Marshall, Director  
Division of Classification

Enclosure:  
Proposed draft letter from Chairman  
to Laser Classification Panel

\*Secretariat Note: Information Meeting 1078

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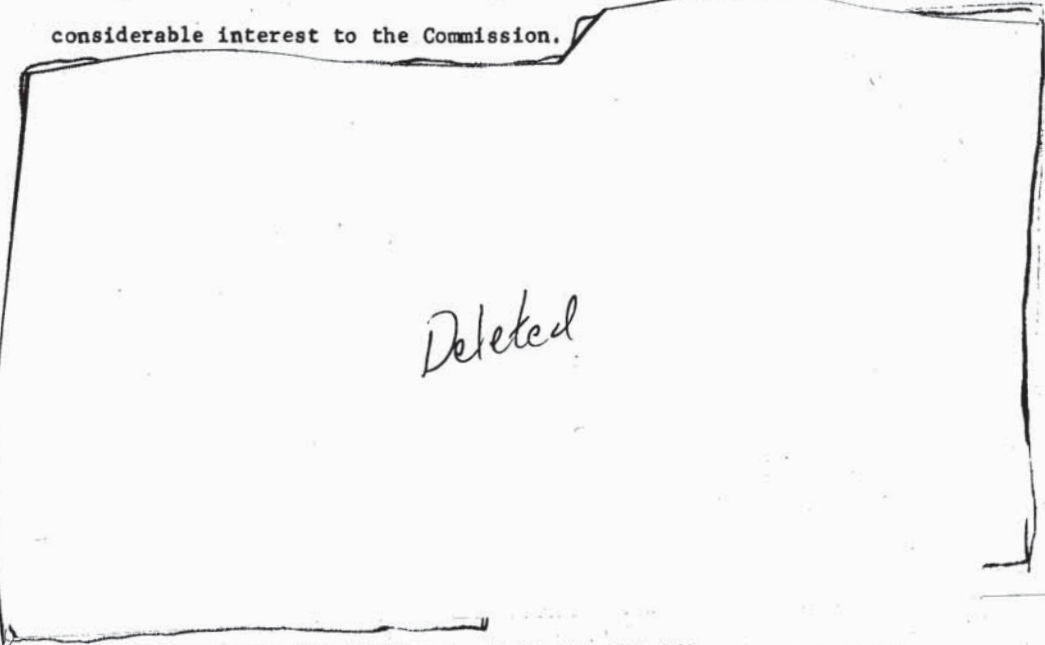
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DRAFT

11/16/70

Dear \_\_\_\_\_:

The use of lasers in the design of weapons has been a subject of considerable interest to the Commission.



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This guidance (Classification Bulletin WNP-36), a copy of which is enclosed, was prepared by our weapons laboratories acting with the assistance of research workers from the Controlled Thermonuclear Program (Sherwood) and others. It has been extensively studied by our Committee of Scientific Reviewers and in its present form has been accepted by that Committee and by the Sherwood Program. There is also enclosed a copy of our classification guidance "DoD Security Classification Guidelines for High Power/Energy Gas Lasers", which is in effect

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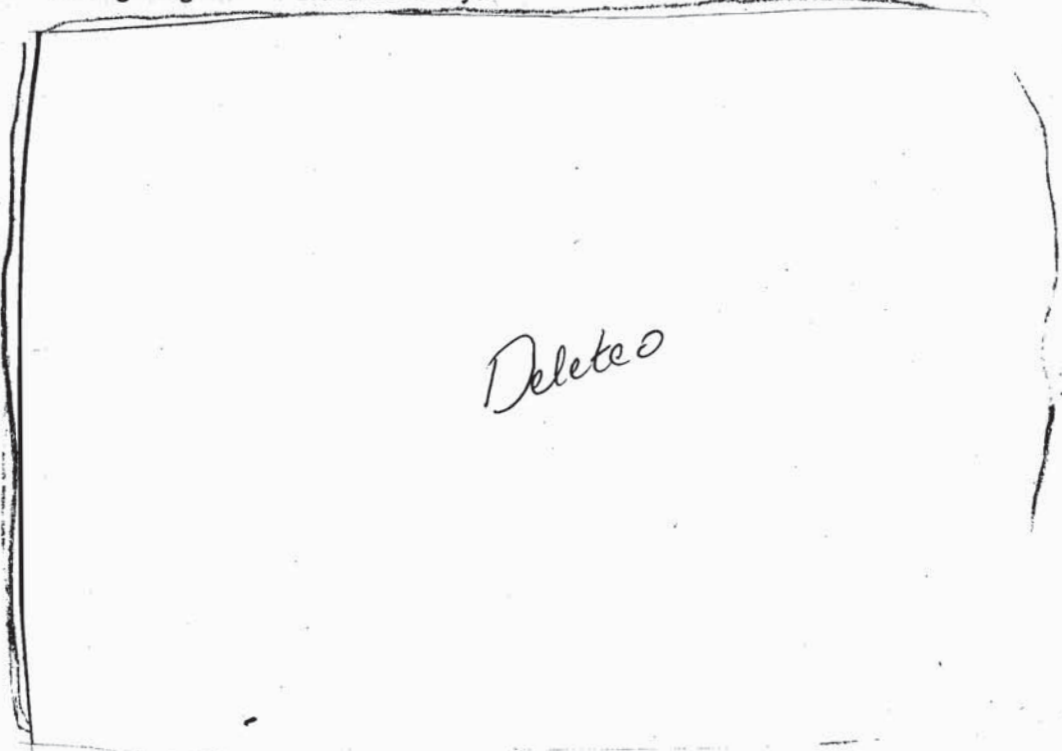
Now, evidence is beginning to mount which indicates that U.S. scientists outside the AEC program and some in foreign countries are doing some rather extensive work in the application of lasers to solving the problems of controlled thermonuclear reactors for the production of energy. Some of our workers give indication of pursuing some of the same paths that our weapons designers followed and are following, and in doing so are becoming involved in activities which are classified under the classification guidance now in effect. This is so because the classification guidance which defines information as Restricted Data under the Atomic Energy Act is applicable not only to individuals working under the sponsorship of the U.S. Government but to all citizens of the United States. Therefore, it is necessary to inform such citizens of the Restricted Data aspect of work they may be doing and of the need to either terminate such work or continue it under arrangements that insure protection of classified information.

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The Commission tends to believe that this information should continue to be classified although we feel that our classification rules on this subject should provide university researchers with the maximum possible freedom within the limits of national security. This has led to a decision to review the current classification guide to determine whether, within the guidelines established above, it can be modified without endangering the national security.

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Within the framework described by items (a) through (f), and  
the desire of the Commission to provide researchers in this field

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much latitude as possible within the limits of national security, the Commission requests that the Panel consider the following specific questions and give us the benefit of its advice on each of them.

1. Is it reasonable to classify as Secret Defense Information information on lasers which are capable of power outputs of  $10^5$  joules or more in ten nanoseconds or less? Are such limits practical? Does the Panel feel that some basis other than power and time should be adopted as defining the classified areas? If not, are there some other dividing lines of power and time which the Panel feels would be more appropriate?
2. Do the current classification rules concerning experiments and experimental plans utilizing laser initiated external inertial confinement and compression provide independent researchers with all of the freedom practicable within the national security?

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4. Can any theoretical calculations and experiments involving the use of laser radiation for the following purposes be declassified:

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(1) symmetrically implode materials to a ten-fold or greater compression, (2) obtain a density in hydrogen and its isotopes as great or greater than one gram atom per cubic centimeter, (3) produce a pulse of thermonuclear yield having a peak specific power output density anywhere greater than  $10^{15}$  watts per cubic centimeter, or (4) produce a pulse of TN yield having a specific power output density anywhere greater than  $10^{15}$  watts per cubic centimeter if DT were substituted for relatively inert isotopes in experiments in which such power output densities were not achieved.

5. Can there be any relaxation of the current classification now in effect on information concerning the time shaping of the laser output?

I hope you will agree to serve as a member of this Panel. Since there is some urgency in this matter, it is our hope that the Panel will be able to meet during the first week in January. The Director of Classification, who will be attending the Panel meetings as the AEC representative, will make such arrangements as the Panel may desire for briefings or discussions with individuals of the Panel's choice.

Sincerely,

Chairman

Enclosures:  
As stated above

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UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

October 5, 1970

**CLASSIFICATION BULLETIN** WNP-36

LASERS AND THEIR APPLICATIONS

This bulletin supersedes Classification Bulletin WNP-35.

- 1. Lasers which are capable of power outputs of  $10^5$  joules or more in ten nanoseconds or less. SECRET
- 2. Studies on new laser design concepts which demonstrate feasibility of outputs of  $10^5$  joules or more in ten nanoseconds or less. SECRET
- 3. Laser experiments or experimental plans that utilize external inertial confinement or external inertial compression of plasma. SECRET-RD

NOTE: Inertial means that the pressure required to compress or confine is derived from the acceleration or deceleration of condensed matter. However, heating all or part of an isolated homogeneous mass by a focused energy source may not be classified. (See 4)

Compression or confinement of plasma solely by means of electromagnetic fields is unclassified. Information on plasma confinement by neutral gases is unclassified. Confinement by unheated fuel itself is not external inertial confinement, and may not be classified. (See 4)

- 4. a. Theoretical calculations or experiments aimed at achieving a pure fusion nuclear explosion. SECRET-RD
- b. Theoretical calculations or experiments involving the use of laser radiation to implode materials to high compression, (ten-fold or greater) using spherical or cylindrical convergence. SECRET-RD

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- c. Theoretical calculations or experiments producing a density in hydrogen or its isotopes of 1 gram atom or more, per cubic centimeter, or a pulse of thermonuclear yield having a peak specific power output density anywhere greater than  $10^{15}$  watts per cubic centimeter. SECRET-RD

NOTE: This is not intended to apply to steady burn.

- d. Calculations or experiments that do not produce a specific power output density greater than  $10^{15}$  watts per cubic centimeter only because they involve a relatively inert mixture of hydrogen isotopes (e.g., D-D) but would produce greater than  $10^{15}$  watts per cubic centimeter if D-T were substituted. SECRET-RD

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8. Information confirming the feasibility of pure fusion devices. SECRET-RD

9. For theoretical calculations or experiments directed at investigating or developing a laser driven nuclear explosion:

- a. Parameters of the laser or its operation that reveal classified information about the nuclear system.  
CLASSIFIED ACCORDING TO THE  
CLASSIFICATION OF THE INFORMATION THAT WOULD BE REVEALED.
- b. Time-shaping of the laser output for purposes of time-shaping the external pressures on the nuclear capsule in order to produce a more efficient implosion. Specifically, a pressure that is initially low, but which rises with time roughly matching the internal pressures in the imploding capsule, and which terminates with a final pressure pulse that provides the main heating of the capsule. SECRET-RD

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Desired Protection

The above guidance attempts to provide a safe, quantitative boundary between conditions involved in a thermonuclear explosion and conditions that exist in various forms of controlled thermonuclear burn or that might be achieved in an unfeasible design of a thermonuclear explosive. However, unsuccessful attempts at thermonuclear explosive design may still involve some valid concepts of thermonuclear weapon design or concepts likely to lead to successful laser/pellet explosive designs. Therefore it may be helpful to list what concepts appear to warrant protection. Most are already specified in the weapons classification guide, but may be overlooked in the context of micro-explosion capsules.

The following appear to be areas of laser/pellet technology that require classification protection:

1. Designs of apparatus capable of producing a nuclear explosion (including micro-explosions of pellets). Design concepts that could lead to such capability.
2. Concepts and designs reducing the input energy required to achieve a nuclear explosion.

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Examples of the above requiring classification:

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- d. Capsule implosion--using an implosion to create high temperatures and densities in thermonuclear fuel.

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h. Radiation channel around a capsule, dense inertial wall outside the channel.

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C. L. Marshall, Director  
Division of Classification

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